

Regulation (EU) 2023/1230**1 - ESSENTIAL HEALTH AND SAFETY REQUIREMENTS****1.1 - General remarks****1.1.1 - Applicability**

The obligations laid down by the essential health and safety requirements are applicable to partly completed machinery insofar as those requirements are relevant.

The relevant requirements in relation to partly completed machinery do not cover the requirements that can only be fulfilled at the time of the incorporation of the partly completed machinery. However, the principles of safety integration established in section 1.1.2 are applicable in all cases.

CEN

Type Std A: EN ISO 12100

CENELEC | Other

Rules: ISO/TR 14121-2

1.1.2 - Principles of safety integration

- (a) Machinery or related products shall be designed and constructed so that they are fit for their function, and can be operated, adjusted and maintained without putting persons at risk when these operations are carried out under the conditions foreseen but also taking into account any reasonably foreseeable misuse thereof. The aim of protective measures shall be to eliminate any risk throughout the foreseeable lifetime of the machinery or related product including the phases of transport, assembly, dismantling, disabling and scrapping.
- (b) In selecting the most appropriate methods, the manufacturer shall apply the following principles, in the order given:
 - (i) eliminate hazards or, if that is not possible, minimise risks (inherently safe machinery or related product design and construction);
 - (ii) take the necessary protective measures in relation to risks that cannot be eliminated;
 - (iii) inform users of the residual risks due to any shortcomings of the protective measures adopted, indicate whether any particular training is required and specify any need to provide personal protective equipment.
- (c) When designing and constructing machinery or a related product and when drafting the instructions for use, the manufacturer shall envisage not only the intended use of the machinery or related product but also any reasonably foreseeable misuse thereof. The machinery or related product shall be designed and constructed in such a way as to prevent abnormal use if such use would engender a risk. Where appropriate, the instructions for use shall draw the user's attention to ways - which experience has shown might occur - in which the machinery or related product should not be used.
- (d) Machinery or related products shall be designed and constructed to take account of the constraints to which the operator is subject as a result of the necessary or foreseeable use of personal protective equipment.
- (e) Machinery or related products shall be designed and constructed in such a way that it is possible for the user, where applicable, to test the safety functions. The machinery or related product shall be supplied with all the special equipment and accessories, and where appropriate, with the description of specific functional test procedures, essential to enable it to be tested, adjusted, maintained and used safely.

CEN

Type Std A: EN ISO 12100

CENELEC | Other

Rules: ISO/TR 14121-2

1.1.3 - Materials and products

The materials used to construct machinery or related products, or products used or created during its use, shall not endanger the health and safety of persons. In particular, where fluids are used, machinery or related products shall be designed and constructed to prevent risks due to filling, use, recovery or draining.

CEN

Type Std A: EN ISO 12100

CENELEC | Other

Rules: ISO/TR 14121-2

1.1.4 - Lighting

Machinery or related products shall be supplied with integral lighting suitable for the operations concerned, where the absence thereof is likely to cause a risk despite ambient lighting of normal intensity.

Machinery or related products shall be designed and constructed so that there is no area of shadow likely to cause nuisance, that there is no irritating dazzle and that there are no dangerous stroboscopic effects on moving parts due to the lighting.

Internal parts requiring frequent inspection and adjustment, and maintenance areas shall be provided with appropriate lighting.

CEN

Type Std A: EN ISO 12100

Type Std B: EN 1837

CENELEC | Other

Rules: ISO/TR 14121-2

1.1.5 - Design of machinery or a related product to facilitate its handling

Machinery or a related product or each component part thereof, shall:

- (a) be capable of being handled and transported safely;
- (b) be packaged or designed so that it can be stored safely and without damage.

During the transportation of the machinery or related product or its component parts, there shall be no possibility of sudden movements or of hazards due to instability as long as the machinery or related product or its component parts are handled in accordance with the instructions.

Where the weight, size or shape of machinery or a related product or its various component parts prevents it or them from being moved by hand, the machinery or related product or each component part shall:

- (a) either be fitted with attachments for lifting gear; or

1.1.5 - Design of machinery or a related product to facilitate its handling

- (b) be designed so that it can be fitted with such attachments; or
- (c) be shaped in such a way that standard lifting gear can easily be attached.

Where machinery or a related product or one of its component parts is to be moved by hand, it shall either:

- (a) be easily moveable; or
- (b) be equipped for picking up and moving safely.

Special arrangements shall be made for the handling of tools and/or machinery or related product parts, which, even if lightweight, could be hazardous.

CEN

Type Std A: EN ISO 12100

Type Std B: EN 1005-1; EN 1005-2; EN 1005-3; EN 1005-4

CENELEC | Other

Rules: ISO/TR 14121-2

1.1.6 - Ergonomics

Under the intended conditions of use, the discomfort, fatigue and physical and psychological stress faced by the operator shall be eliminated or reduced to the minimum possible, taking into account at least, the following ergonomic principles:

- (a) allowing for the variability of the operator's physical dimensions, strength and stamina;
- (b) avoiding the need for demanding work postures or movements and manual force exertions that exceed the operator's capacity;
- (c) providing enough space for movements of the parts of the operator's body;
- (d) avoiding a machine-determined work rate;
- (e) avoiding monitoring that requires lengthy concentration;
- (f) adapting the human-machine interface to the foreseeable characteristics of the operators, including with respect to machinery or a related product with intended fully or partially self-evolving behaviour or logic that is designed to operate with varying levels of autonomy;
- (g) where relevant, adapting machinery or a related product with intended fully or partially self-evolving behaviour or logic that is designed to operate with varying levels of autonomy to respond to people adequately and appropriately (such as verbally through words and non-verbally through gestures, facial expressions or body movement) and to communicate its planned actions (such as what it is going to do and why) to operators in a comprehensible manner.

CEN

Type Std A: EN ISO 12100

Type Std B: EN 1005-1; EN 1005-2; EN 1005-3; EN 1005-4; EN 1005-5; EN 614-1; EN 614-2; EN 547-1; EN 547-2; EN 547-3; EN 894-1; EN 894-2; EN 894-3; EN 894-4; EN ISO 13732-1; EN ISO 13732-3; EN ISO 7731; EN ISO 14738; EN ISO 15536-1

CENELEC | Other

Rules: ISO/TR 14121-2

1.1.7 - Operating positions

The operating position shall be designed and constructed in such a way as to avoid any risk due to exhaust gases or lack of oxygen.

If the machinery or related product is intended to be used in a hazardous environment presenting risks to the health and safety of the operator or if the machinery or related product itself gives rise to a hazardous environment, adequate means shall be provided to ensure that the operator has good working conditions and is protected against any foreseeable hazards.

Where appropriate, the operating position shall be fitted with an adequate cabin designed, constructed or equipped to fulfil the above requirements. The exit shall allow rapid evacuation. Moreover, when applicable, an emergency exit shall be provided in a direction which is different from the usual exit.

CEN

Type Std A: EN ISO 12100

Type Std B: EN 1093-1; EN 1093-2; EN 1093-3; EN 1093-4; EN 1093-5; EN 1093-6; EN 1093-7; EN 1093-8; EN 1093-9; EN 1093-11; EN ISO 14738

CENELEC | Other

Rules: ISO/TR 14121-2

1.1.8 - Seating

Where appropriate and where the working conditions so permit, work stations constituting an integral part of the machinery or related product shall be designed for the installation of seats.

If the operator is intended to sit during operation and the operating position is an integral part of the machinery or related product, the seat shall be provided with the machinery or related product.

The operator's seat shall enable him or her to maintain a stable position. Furthermore, the seat and its distance from the control devices shall be capable of being adapted to the operator.

If the machinery or related product is subject to vibrations, the seat shall be designed and constructed in such a way as to reduce the vibrations transmitted to the operator to the lowest level that is reasonably possible.

The seat mountings shall withstand all stresses to which they can be subjected. Where there is no floor beneath the feet of the operator, footrests covered with a slip-resistant material shall be provided.

CEN

Type Std A: EN ISO 12100

Type Std B: EN 1005-1; EN 1005-2; EN 1005-3; EN 1005-4, EN ISO 14738, EN ISO 10326-1

CENELEC | Other

Rules: ISO/TR 14121-2

1.1.9 - Protection against corruption

The machinery or related product shall be designed and constructed so that the connection to it of another device, via any feature of the connected device itself or via any remote device that communicates with the machinery or related product does not lead to a hazardous situation.

A hardware component transmitting signal or data, relevant for connection or access to software that is critical for the compliance of the machinery or related product with the relevant essential health and safety requirements shall be designed so that it is

1.1.9 - Protection against corruption

adequately protected against accidental or intentional corruption.

The machinery or related product shall collect evidence of a legitimate or illegitimate intervention in that hardware component, when relevant for connection or access to software that is critical for the compliance of the machinery or related product.

Software and data that are critical for the compliance of the machinery or related product with the relevant essential health and safety requirements shall be identified as such and shall be adequately protected against accidental or intentional corruption.

The machinery or related product shall identify the software installed on it that is necessary for it to operate safely, and shall be able to provide that information at all times in an easily accessible form.

The machinery or related product shall collect evidence of a legitimate or illegitimate intervention in the software or a modification of the software installed on the machinery or related product or its configuration.

CEN

Type Std A: EN ISO 12100

Type Std B: EN ISO 13849-1; EN ISO 13849-2; IEC/EN 62061; EN 60204-1

CENELEC | Other

Rules: ISO/TR 14121-2

1.2 - Control systems

1.2.1 - Safety and reliability of control systems

Control systems shall be designed and constructed in such a way as to prevent hazardous situations from arising.

Control systems shall be designed and constructed in such a way that:

- (a) they can withstand, where appropriate to the circumstances and the risks, the intended operating stresses and intended and unintended external influences, including reasonably foreseeable malicious attempts from third parties leading to a hazardous situation;
- (b) a fault in the hardware or the logic of the control system shall not lead to hazardous situations;
- (c) errors in the control system logic shall not lead to hazardous situations;
- (d) the limits of the safety functions are to be established as part of the risk assessment performed by the manufacturer and no modifications are allowed to the settings or rules generated by the machinery or related product or by operators, including during the machinery or related product learning phase, where such modifications could lead to hazardous situations;
- (e) reasonably foreseeable human errors during operation shall not lead to hazardous situations;
- (f) the tracing log of the data generated in relation to an intervention and of the versions of safety software uploaded after the machinery or related product has been placed on the market or put into service is enabled for five years after such upload, exclusively to demonstrate the conformity of the machinery or related product with this Annex further to a reasoned request from a competent national authority.

Control systems of machinery or related products with fully or partially self-evolving behaviour or logic that are designed to operate with varying levels of autonomy shall be designed and constructed in such a way that:

- (a) they shall not cause the machinery or related product to perform actions beyond its defined task and movement space;
- (b) recording of data on the safety related decision-making process for software based safety systems ensuring safety function including safety components, after the machinery or related product has been placed on the market or put into service, is enabled and that such data is retained for one year after its collection, exclusively to demonstrate the conformity of the machinery or related product with this Annex further to a reasoned request from a competent national authority;
- (c) it shall be possible at all times to correct the machinery or related product in order to maintain its inherent safety.

Particular attention shall be given to the following points:

- (a) the machinery or related product shall not start unexpectedly;
- (b) the parameters of the machinery or related product shall not change in an uncontrolled way, where such change could lead to hazardous situations;
- (c) modifications to the settings or rules, generated by the machinery or related product or by operators, including during the machinery or related product learning phase, shall be prevented, where such modifications could lead to hazardous situations;
- (d) the machinery or related product shall not be prevented from stopping if the stop command has already been given;
- (e) no moving part of the machinery or related product or piece held by the machinery or related product shall fall or be ejected;
- (f) automatic or manual stopping of the moving parts, whatever they may be, shall be unimpeded;
- (g) the protective devices shall remain fully effective or give a stop command;
- (h) the safety-related parts of the control system shall apply in a coherent way to the whole of an assembly of machinery or related products or partly completed machinery, or a combination thereof.

For wireless control, a failure of the communication or connection or a faulty connection shall not lead to a hazardous situation.

CEN

Type Std A: EN ISO 12100

Type Std B: EN ISO 13849-1; EN ISO 13849-2; IEC/EN 62061; EN 60204-1

CENELEC | Other

Rules: ISO/TR 14121-2

1.2.2 - Control devices

Control devices shall be:

- (a) clearly visible and identifiable, using pictograms where appropriate;
- (b) positioned in such a way as to be safely operated without hesitation or loss of time and without ambiguity;
- (c) designed in such a way that the movement of the control device is consistent with its effect;
- (d) located outside the danger zones, except where necessary for certain control devices such as an emergency stop or a teach pendant;
- (e) positioned in such a way that their operation cannot cause additional risk;
- (f) designed or protected in such a way that the desired effect, where a hazard is involved, can only be achieved by a deliberate action;
- (g) made in such a way as to withstand foreseeable forces, paying particular attention to emergency stop devices liable to be subjected to considerable forces.

Where a control device is designed and constructed to perform several different actions, namely, where there is no one-to-one correspondence, the action to be performed shall be clearly displayed and subject to confirmation, where necessary.

Control devices shall be so arranged that their layout, travel and resistance to operation are compatible with the action to be

1.2.2 - Control devices

performed, taking account of ergonomic principles.

Machinery or related products shall be fitted with indicators as required for safe operation. The operator shall be able to read them from the control position.

From each control position, the operator shall be able to ensure that no one is in the danger zones, or the control system shall be designed and constructed in such a way that starting is prevented while someone is in the danger zone.

If neither of these possibilities is applicable, before the machinery or related product starts, an acoustic and/or visual warning signal shall be given. The exposed persons shall have time to leave the danger zone or prevent the machinery starting up.

If necessary, means shall be provided to ensure that the machinery or related product can be controlled only from control positions located in one or more predetermined zones or locations.

Where there is more than one control position, the control system shall be designed in such a way that the use of one of them precludes the use of the others, except for stop controls and emergency stops.

When the machinery or related product has two or more operating positions, each position shall be provided with all the required control devices without the operators hindering or putting each other into a hazardous situation.

CEN

Type Std A: EN ISO 12100

Type Std B: EN 981; EN 894-1; EN 894-2; EN 894-3; EN 894-4

CENELEC | Other

Rules: ISO/TR 14121-2

1.2.3 - Starting

It shall be possible to start the machinery or related product only by voluntary actuation of a control device provided for the purpose.

The same requirement applies:

- (a) when restarting the machinery or related product after a stoppage, whatever the cause;
- (b) when effecting a significant change in the operating conditions.

However, the restarting of the machinery or related product or a change in operating conditions may be effected by voluntary actuation of a device other than the control device provided for the purpose, on condition that this does not lead to a hazardous situation.

For the machinery or related product functioning in automatic mode, the starting of the machinery or related product, restarting after a stoppage, or a change in operating conditions may be possible without intervention, provided this does not lead to a hazardous situation.

Where the machinery or related product has several starting control devices and the operators can therefore put each other in danger, additional devices shall be fitted to rule out such risks. If safety requires that starting and/or stopping shall be performed in a specific sequence, there shall be devices that ensure that these operations are performed in the correct order.

CEN

Type Std A: EN ISO 12100

Type Std B: EN ISO 14118

CENELEC | Other

Rules: ISO/TR 14121-2

1.2.4 - Stopping

1.2.4.1 - Normal stop

The machinery or related product shall be fitted with a control device whereby the machinery can be brought safely to a complete stop.

Each workstation shall be fitted with a control device to stop some or all of the functions of the machinery or related product, depending on the existing hazards, so that the machinery or related product is rendered safe.

The machinery or related product's stop control shall have priority over the start controls.

Once the machinery or related product or its hazardous functions have stopped, the energy supply to the actuators concerned shall be cut off.

CEN

Type Std A: EN ISO 12100

Type Std B: EN 60204-1

CENELEC | Other

Rules: ISO/TR 14121-2

1.2.4.2 - Operational stop

Where, for operational reasons, a stop control that does not cut off the energy supply to the actuators is required, the stop condition shall be monitored and maintained.

CEN

Type Std A: EN ISO 12100

Type Std B: EN 60204-1

CENELEC | Other

Rules: ISO/TR 14121-2

1.2.4.3 - Emergency stop

The machinery or related product shall be fitted with one or more emergency stop devices to enable actual or impending danger to be averted.

The following exceptions apply:

- (a) the machinery or related product in which an emergency stop device would not lessen the risk, either because it would not reduce the stopping time or because it would not enable the special measures required to deal with the risk to be taken;
- (b) portable hand-held or hand-guided machinery or related products.

The device shall:

- (a) have clearly identifiable, clearly visible and quickly accessible control devices;
- (b) stop the hazardous process as quickly as possible, without creating additional risks;

1.2.4.3 - Emergency stop

(c) where necessary, trigger or permit the triggering of certain safeguard movements.

Once active operation of the emergency stop device has ceased following a stop command, that command shall be sustained by engagement of the emergency stop device until that engagement is specifically over ridden; it shall not be possible to engage the device without triggering a stop command; it shall be possible to disengage the device only by an appropriate operation, and disengaging the device shall not restart the machinery or related product but only permit restarting.

The emergency stop function shall be available and operational at all times, regardless of the operating mode.

Emergency stop devices shall be a backup to other safeguarding measures and not a substitute for them.

CEN

Type Std A: EN ISO 12100

Type Std B: EN ISO 13850; EN 60947-5-5; EN 60204-1

CENELEC | Other

Rules: ISO/TR 14121-2

1.2.4.4 - Assembly of machinery or related products

In the case of machinery or a related product or parts of machinery or a related product designed to work together, the machinery or a related product shall be designed and constructed in such a way that the stop controls, including the emergency stop devices, can stop not only the machinery or related product itself but also all related equipment, if its continued operation may be dangerous.

CEN

Type Std A: EN ISO 12100

Type Std B: EN 60204-1

CENELEC | Other

Rules: ISO/TR 14121-2

1.2.5 - Selection of control or operating modes

The control or operating mode selected shall override all other control or operating modes, with the exception of the emergency stop.

If the machinery or related product has been designed and constructed to allow its use in several control or operating modes requiring different protective measures and/or work procedures, it shall be fitted with a mode selector, which can be locked in each position. Each position of the selector shall be clearly identifiable and shall correspond to a single operating or control mode.

The selector may be replaced by another selection method, which restricts the use of certain functions of the machinery or related product to certain categories of operator.

If, for certain operations, the machinery or related product shall be able to operate with a guard displaced or removed and/or a protective device disabled, the control or operating mode selector shall simultaneously:

- (a) disable all other control or operating modes;
- (b) permit operation of hazardous functions only by control devices requiring sustained action;
- (c) permit the operation of hazardous functions only in reduced risk conditions while preventing hazards from linked sequences;
- (d) prevent any operation of hazardous functions by voluntary or involuntary action on the machinery's or related product's sensors.

If these four conditions cannot be fulfilled simultaneously, the control or operating mode selector shall activate other protective measures designed and constructed to ensure a safe intervention zone.

In addition, the operator shall be able to control the operation of the parts he or she is working on from the adjustment point.

CEN

Type Std A: EN ISO 12100

Type Std B: EN ISO 13849-1; EN ISO 13849-2; EN 62061; EN 60204-1

CENELEC | Other

Rules: ISO/TR 14121-2

1.2.6 - Failure of the power supply or communication network connection

The interruption, the re-establishment after an interruption or the fluctuation in whatever manner of the power supply or communication network connection to the machinery or related product shall not lead to hazardous situations.

Particular attention shall be given to the following:

- (a) the machinery or related product shall not start unexpectedly;
- (b) the parameters of the machinery shall not change in an uncontrolled way when such change can lead to hazardous situations;
- (c) the machinery or related product shall not be prevented from stopping if the stop command has already been given;
- (d) no moving part of the machinery or related product or piece held by the machinery or related product shall fall or be ejected;
- (e) automatic or manual stopping of the moving parts, whatever they may be, shall be unimpeded;
- (f) the protective devices shall remain fully effective or give a stop command.

CEN

Type Std A: EN ISO 12100

Type Std B: EN 60204-1

CENELEC | Other

Rules: ISO/TR 14121-2

1.3 - Protection against mechanical risks

1.3.1 - Risk of loss of stability

The machinery or related product and its components and fittings shall be stable enough to avoid over turning, falling or uncontrolled movements during transportation, assembly, dismantling and any other action involving the machinery or related product.

If the shape of the machinery or related product itself or its intended installation does not offer sufficient stability, appropriate means of anchorage shall be incorporated and indicated in the instructions for use.

CEN

Type Std A: EN ISO 12100

1.3.1 - Risk of loss of stability

CENELEC | Other

Rules: ISO/TR 14121-2

1.3.2 - Risk of break-up during operation

The various parts of machinery or related products and their linkages shall be able to withstand the stresses to which they are subject when used.

The durability of the materials used shall be adequate for the nature of the working environment foreseen by the manufacturer, in particular as regards the phenomena of fatigue, ageing, corrosion and abrasion.

The instructions for use shall indicate the type and frequency of inspections and maintenance required for safety reasons. They shall, where appropriate, indicate the parts subject to wear and the criteria for replacement.

Where a risk of rupture or disintegration remains despite the measures taken, the parts concerned shall be mounted, positioned or guarded in such a way that any fragments will be contained, preventing hazardous situations.

Both rigid and flexible pipes carrying fluids, particularly those under high pressure, shall be able to withstand the foreseen internal and external stresses and shall be firmly attached or protected to ensure that no risk is presented by a rupture.

Where the material to be processed is fed to the tool automatically, the following conditions shall be fulfilled to avoid risks to persons:

- (a) when the work piece comes into contact with the tool, the latter shall have attained its normal working condition;
- (b) when the tool starts and/or stops (intentionally or accidentally), the feed movement and the tool movement shall be coordinated.

CEN

Type Std A: EN ISO 12100

Type Std B: EN 4413; EN 4414

CENELEC | Other

Rules: ISO/TR 14121-2

1.3.3 - Risks due to falling or ejected objects

Precautions shall be taken to prevent risks from falling or ejected objects.

CEN

Type Std A: EN ISO 12100

CENELEC | Other

Rules: ISO/TR 14121-2

1.3.4 - Risks due to surfaces, edges or angles

Insofar as their purpose allows, accessible parts of the machinery or a related product shall have no sharp edges, no sharp angles and no rough surfaces likely to cause injury.

CEN

Type Std A: EN ISO 12100

CENELEC | Other

Rules: ISO/TR 14121-2

1.3.5 - Risks related to a combined machinery or related product

Where the machinery or related product is intended to carry out several different operations with manual removal of the piece between each operation (combined machinery or related product), it shall be designed and constructed in such a way as to enable each element to be used separately without the other elements constituting a risk for exposed persons.

For this purpose, it shall be possible to start and stop separately any elements that are not protected.

CEN

Type Std A: EN ISO 12100

CENELEC | Other

Rules: ISO/TR 14121-2

1.3.6 - Risks related to variations in operating conditions

Where the machinery or related product performs operations under different conditions of use, it shall be designed and constructed in such a way that selection and adjustment of these conditions can be carried out safely and reliably.

CEN

Type Std A: EN ISO 12100

CENELEC | Other

Rules: ISO/TR 14121-2

1.3.7 - Risks related to moving parts

The moving parts of the machinery or related product shall be designed and constructed in such a way as to prevent risks of contact which could lead to accidents or shall, where risks persist, be fitted with guards or protective devices.

All necessary steps shall be taken to prevent accidental blockage of moving parts. In cases where, despite the precautions taken, a blockage is likely to occur, the necessary specific protective devices and tools shall, when appropriate, be provided to enable the equipment to be safely unblocked.

The instructions for use and, where possible, a sign on the machinery or related product shall identify these specific protective devices and how they are to be used.

The prevention of risks of contact leading to hazardous situations and the psychological stress that may be caused by the interaction with the machinery shall be adapted to:

- (a) human-machine coexistence in a shared space without direct collaboration;
- (b) human-machine interaction.

CEN

Type Std A: EN ISO 12100

Type Std B: EN ISO 13857; EN 349

1.3.7 - Risks related to moving parts

CENELEC | Other

Rules: ISO/TR 14121-2

1.3.8 - Choice of protection against risks arising from moving parts

Guards or protective devices designed to protect against risks arising from moving parts shall be selected on the basis of the type of risk. The following guidelines shall be used to help to make the choice.

CEN

Type Std A: EN ISO 12100

CENELEC | Other

Rules: ISO/TR 14121-2

1.3.8.1 - Moving transmission parts

Guards designed to protect persons against the hazards generated by moving transmission parts shall be:

- (a) either fixed guards as referred to in section 1.4.2.1; or
- (b) interlocking movable guards as referred to in section 1.4.2.2.

Interlocking movable guards shall be used where frequent access is envisaged.

CEN

Type Std A: EN ISO 12100

CENELEC | Other

Rules: ISO/TR 14121-2

1.3.8.2 - Moving parts involved in the process

Guards or protective devices designed to protect persons against the hazards generated by moving parts involved in the process shall be:

- (a) either fixed guards as referred to in section 1.4.2.1; or
- (b) interlocking movable guards as referred to in section 1.4.2.2; or
- (c) protective devices as referred to in section 1.4.3; or
- (d) a combination of the above.

However, when certain moving parts directly involved in the process cannot be made completely inaccessible during operation owing to operations requiring operator intervention, such parts shall be fitted with:

- (a) fixed guards or interlocking movable guards preventing access to those sections of the parts that are not used in the work; and
- (b) adjustable guards as referred to in section 1.4.2.3 restricting access to those sections of the moving parts where access is necessary.

CEN

Type Std A: EN ISO 12100

CENELEC | Other

Rules: ISO/TR 14121-2

1.3.9 - Risks of uncontrolled movements

When a part of the machinery or related product has been stopped, any drift away from the stopping position, for whatever reason other than action on the control devices, shall be prevented or shall be such that it does not present a risk.

CEN

Type Std A: EN ISO 12100

CENELEC | Other

Rules: ISO/TR 14121-2

1.4 - Required characteristics of guards and protective devices

1.4.1 - General requirements

Guards and protective devices shall:

- (a) be of robust construction;
- (b) be securely held in place;
- (c) not give rise to any additional hazard;
- (d) not be easy to by-pass or render non-operational;
- (e) be located at an adequate distance from the danger zone;
- (f) cause minimum obstruction to the view of the production process, and;
- (g) enable essential work to be carried out on the installation and/or replacement of tools and for main tenance purposes by restricting access exclusively to the area where the work has to be done, if possible without the guard having to be removed or the protective device having to be disabled.

In addition, guards shall, where possible, protect against the ejection or falling of materials or objects and against emissions generated by the machinery or related product.

CEN

Type Std A: EN ISO 12100

Type Std B: EN ISO 13857; EN ISO 13855; EN ISO 14120

CENELEC | Other

Rules: ISO/TR 14121-2

1.4.2 - Special requirements for guards

1.4.2.1 - Fixed guards

Fixed guards shall be fixed by systems that can be opened or removed only with tools.

Their fixing systems shall remain attached to the guards or to the machinery or related product when the guards are removed.

Where possible, guards shall be incapable of remaining in place without their fixings.

CEN

1.4.2.1 - Fixed guards**Type Std A:** EN ISO 12100**Type Std B:** EN ISO 14120**CENELEC | Other****Rules:** ISO/TR 14121-2**1.4.2.2 - Interlocking movable guards**

Interlocking movable guards shall:

- (a) as far as possible remain attached to the machinery or related product when open;
- (b) be designed and constructed in such a way that they can be adjusted only by means of an intentional action.

Interlocking movable guards shall be associated with an interlocking device that:

- (a) prevents the start of hazardous machinery or related product functions until those guards are closed; and
- (b) gives a stop command whenever those guards are no longer closed.

Where it is possible for an operator to reach the danger zone before the risk due to the hazardous machinery or related product functions has ceased, movable guards shall be associated with a guard locking device in addition to an interlocking device that:

- (a) prevents the start of hazardous machinery or related product functions until the guard is closed and locked; and
- (b) keeps the guard closed and locked until the risk of injury from the hazardous machinery or related product functions has ceased.

Interlocking movable guards shall be designed in such a way that the absence or failure of one of their components prevents starting or stops the hazardous machinery or related product functions.

CEN**Type Std A:** EN ISO 12100**Type Std B:** EN ISO 14120; EN ISO 13855; EN 14119**CENELEC | Other****Rules:** ISO/TR 14121-2**1.4.2.3 - Adjustable guards restricting access**

Adjustable guards restricting access to those areas of the moving parts strictly necessary for the work shall be:

- (a) adjustable manually or automatically, depending on the type of work involved; and
- (b) readily adjustable without the use of tools.

CEN**Type Std A:** EN ISO 12100**Type Std B:** EN ISO 14120**CENELEC | Other****Rules:** ISO/TR 14121-2**1.4.3 - Special requirements for protective devices**

Protective devices shall be designed and incorporated into the control system in such a way that:

- (a) moving parts cannot start up while they are within the operator's reach;
- (b) persons cannot reach moving parts while the parts are moving, and
- (c) the absence or failure of one of their components prevents starting or stops the moving parts.

Protective devices shall be adjustable only by means of an intentional action.

CEN**Type Std A:** EN ISO 12100**Type Std B:** EN ISO 13856-1; EN ISO 13856-2; EN ISO 13856-3; EN 574**CENELEC | Other****Rules:** ISO/TR 14121-2**1.5 - Risks due to other causes****1.5.1 - Electricity supply**

Where machinery or related products have an electricity supply, they shall be designed, constructed and equipped in such a way that all hazards of an electrical nature are or can be prevented.

The safety objectives set out in Directive 2014/35/EU shall apply to machinery or related products. However, the obligations concerning conformity assessment and the placing on the market or putting into service of machinery or related products with regard to electrical risks are governed solely by this Regulation.

CEN**Type Std A:** EN ISO 12100**Type Std B:** EN 60204-1**CENELEC | Other****Rules:** ISO/TR 14121-2**1.5.2 - Static electricity**

Machinery or related products shall be designed and constructed to prevent or limit the build-up of potentially dangerous electrostatic charges and/or be fitted with a discharging system.

CEN**Type Std A:** EN ISO 12100**Type Std B:** EN 60204-1**CENELEC | Other****Rules:** ISO/TR 14121-2**1.5.3 - Energy supply other than electricity**

Where machinery or related products are powered by source of energy other than electricity, they shall be so designed, constructed and equipped as to avoid all potential risks associated with such sources of energy.

CEN

1.5.3 - Energy supply other than electricity**Type Std A:** EN ISO 12100**Type Std B:** EN 4413; EN 4414**CENELEC | Other****Rules:** ISO/TR 14121-2**1.5.4 - Errors of fitting**

Errors likely to be made when fitting or refitting certain parts, which could be a source of risk, shall be made impossible by the design and construction of such parts or, failing this, by information given on the parts themselves or their housings. The same information shall be given on moving parts or their housings where the direction of movement needs to be known in order to avoid a risk.

Where necessary, the instructions for use shall give further information on these risks.

Where a faulty connection can be the source of risk, incorrect connections shall be made impossible by design or, failing this, by information given on the elements to be connected and, where appropriate, on the means of connection.

CEN**Type Std A:** EN ISO 12100**Type Std B:** EN ISO 13732-1; EN ISO 13732-3**CENELEC | Other****Rules:** ISO/TR 14121-2**1.5.5 - Extreme temperatures**

Steps shall be taken to eliminate any risk of injury arising from contact with or proximity to machinery or related product parts or materials at high or very low temperatures.

The necessary steps shall also be taken to avoid or protect against the risk of hot or very cold material being ejected.

CEN**Type Std A:** EN ISO 12100**Type Std B:** EN ISO 13732-1; EN ISO 13732-3**CENELEC | Other****Rules:** ISO/TR 14121-2**1.5.6 - Fire**

Machinery or related products shall be designed and constructed in such a way as to avoid any risk of fire or overheating presented by the machinery or related product itself or by gases, liquids, dust, vapours or other substances produced or used by the machinery or related product.

CEN**Type Std A:** EN ISO 12100**Type Std B:** EN ISO 19353; EN 60204-1**CENELEC | Other****Rules:** ISO/TR 14121-2**1.5.7 - Explosion**

Machinery or related products shall be designed and constructed in such a way as to avoid any risk of explosion presented by the machinery or related product itself or by gases, liquids, dust, vapours or other substances produced or used by the machinery or related product.

Machinery or related products shall comply, as far as the risk of explosion due to its use in a potentially explosive atmosphere is concerned, with the provisions of the specific Union harmonisation legislation.

CEN**Type Std A:** EN ISO 12100**Type Std B:** EN 1127-1; EN 60204-1; EN 1127-2**CENELEC | Other****Rules:** ISO/TR 14121-2**1.5.8 - Noise**

Machinery or related products shall be designed and constructed in such a way that risks resulting from the emission of airborne noise are reduced to the lowest level, taking account of technical progress and the availability of means of reducing noise, in particular at source.

The level of noise emission may be assessed with reference to comparative emission data for similar machinery or related products.

CEN**Type Std A:** EN ISO 12100**Type Std B:** ISO 3743-1; ISO 3743-2; ISO 3744; ISO 3745; ISO 3746; ISO 3747; EN ISO 11201; EN ISO 11202; EN ISO 11203; EN ISO 11204; EN ISO 11205; EN ISO 11688-1; EN ISO 4871**CENELEC | Other****Rules:** ISO/TR 14121-2**1.5.9 - Vibrations**

Machinery or related products shall be designed and constructed in such a way that risks resulting from vibrations produced by the machinery or related product are reduced to the lowest level, taking account of technical progress and the availability of means of reducing vibration, in particular at source.

The level of vibration emission may be assessed with reference to comparative emission data for similar machinery or related products.

CEN**Type Std A:** EN ISO 12100**Type Std B:** EN 1299; EN 12786; EN 1032; EN 30326-1; EN ISO 20643; EN ISO 10326-1**CENELEC | Other****Rules:** ISO/TR 14121-2

1.5.10 - Radiation**1.5.10 - Radiation**

Undesirable radiation emissions from machinery or related products shall be eliminated or be reduced to levels that do not have adverse effects on persons.

Any functional ionising radiation emissions shall be limited to the lowest level, which is sufficient for the proper functioning of the machinery or related product during setting, operation and cleaning. Where a risk exists, the necessary protective measures shall be taken.

Any functional non-ionising radiation emissions during setting, operation and cleaning shall be limited to levels that do not have adverse effects on persons.

CEN

Type Std A: EN ISO 12100

Type Std B: EN 12198-1; EN 12198-2; EN 12198-3; EN 60204-1

CENELEC | Other

Rules: ISO/TR 14121-2

1.5.11 - External radiation

Machinery or related products shall be designed and constructed in such a way that external radiation does not interfere with its operation.

CEN

Type Std A: EN ISO 12100

CENELEC | Other

Rules: ISO/TR 14121-2

1.5.12 - Laser radiation

Where laser equipment is used, the following shall be taken into account:

- (a) laser equipment on machinery or related products shall be designed and constructed in such a way as to prevent any accidental radiation;
- (b) laser equipment on machinery or related products shall be protected in such a way that effective radiation, radiation produced by reflection or diffusion and secondary radiation do not damage health;
- (c) optical equipment for the observation or adjustment of laser equipment on machinery or related products shall be such that no health risk is created by laser radiation.

CEN

Type Std A: EN ISO 12100

Type Std B: EN ISO 11553-1; EN ISO 11553-2; EN 12254; EN ISO 11145; EN ISO 11252; EN ISO 11554

CENELEC | Other

Rules: ISO/TR 14121-2

1.5.13 - Emissions of hazardous materials and substances

Machinery or related products shall be designed and constructed in such a way that risks of inhalation, ingestion, contact with the skin, eyes and mucous membranes and penetration through the skin of hazardous materials and substances which it produces can be avoided.

Where a hazard cannot be eliminated, the machinery or related product shall be so equipped that hazardous materials and substances can be contained, captured, evacuated, precipitated by water spraying, filtered or treated by another equally effective method.

Where the process is not totally enclosed during normal operation of the machinery or related product, the devices for containment or capture, filtration or separation and evacuation shall be situated in such a way as to have the maximum effect.

CEN

Type Std A: EN ISO 12100

Type Std B: EN ISO 14123-1; EN ISO 14123-2

CENELEC | Other

Rules: ISO/TR 14121-2

1.5.14 - Risk of being trapped in a machine

Machinery or related products shall be designed, constructed or fitted with a means of preventing a person from being enclosed within it or, if that is impossible, with a means of summoning help.

CEN

Type Std A: EN ISO 12100

Type Std B: EN 547-1; EN 547-2; EN 547-3

CENELEC | Other

Rules: ISO/TR 14121-2

1.5.15 - Risk of slipping, tripping or falling

Parts of the machinery or related product where persons are liable to move about or stand shall be designed and constructed in such a way as to prevent persons slipping, tripping or falling on or off these parts.

Where appropriate, these parts shall be fitted with handholds that are fixed relative to the user and that enable them to maintain their stability.

CEN

Type Std A: EN ISO 12100

Type Std B: EN ISO 14122-1; EN ISO 14122-2; EN ISO 14122-3; EN ISO 14122-4

CENELEC | Other

Rules: ISO/TR 14121-2

1.5.16 - Lightning

Machinery or related products in need of protection against the effects of lightning while being used shall be fitted with a system for

1.5.16 - Lightning

conducting the resultant electrical charge to earth.

CEN

Type Std A: EN ISO 12100

Type Std B: EN 60204-1

CENELEC | Other

Rules: ISO/TR 14121-2

1.6 - Maintenance**1.6.1 - Machinery or related product maintenance**

Adjustment and maintenance points shall be located outside danger zones. It shall be possible to carry out adjustment, maintenance, repair, cleaning and servicing operations while the machinery or related product is at a standstill.

If one or more of the above conditions cannot be satisfied for technical reasons, measures shall be taken to ensure that these operations can be carried out safely (see section 1.2.5).

In the case of automated machinery and, where necessary, other machinery or related products, a connecting device for mounting diagnostic fault-finding equipment shall be provided.

Automated machinery or related product components, which have to be changed frequently, shall be capable of being removed and replaced easily and safely. Access to the components shall enable these tasks to be carried out with the necessary technical means in accordance with a specified operating method.

CEN

Type Std A: EN ISO 12100

CENELEC | Other

Rules: ISO/TR 14121-2

1.6.2 - Access to operating positions and servicing points

Machinery or related products shall be designed and constructed in such a way as to allow access in safety to all areas where intervention is necessary during operation, adjustment, maintenance and cleaning of the machinery or related product.

In the case of machinery or related products into which persons shall enter for operation, adjustment, maintenance or cleaning, the machinery accesses shall be dimensioned and adapted for the use of rescue equipment in such a way that an emergency rescue of the persons is possible.

CEN

Type Std A: EN ISO 12100

Type Std B: EN 547-1; EN 547-2; EN 547-3; EN ISO 14122-1; EN ISO 14122-2; EN ISO 14122-3; EN ISO 14122-4

CENELEC | Other

Rules: ISO/TR 14121-2

1.6.3 - Isolation of energy sources

Machinery or related products shall be fitted with means to isolate it from all energy sources. Such isolators shall be clearly identified. They shall be capable of being locked if reconnection could endanger persons.

Isolators shall also be capable of being locked where an operator is unable, from any of the points to which he or she has access, to check that the energy is still cut off.

In the case of machinery or related products capable of being plugged into an electricity supply, removal of the plug is sufficient, if the operator can check from any of the points to which he or she has access that the plug remains removed.

After the energy is cut off, it shall be possible to dissipate normally any energy remaining or stored in the circuits of the machinery or related product without risk to persons.

As an exception to the requirement laid down in the previous paragraphs, certain circuits may remain connected to their energy sources in order, for example, to hold parts, to protect information, to light interiors, etc. In this case, special steps shall be taken to ensure operator safety.

CEN

Type Std A: EN ISO 12100

Type Std B: EN ISO 14118; EN 60204-1

CENELEC | Other

Rules: ISO/TR 14121-2

1.6.4 - Operator intervention

The machinery or related product shall be so designed, constructed and equipped that the need for operator intervention is limited. If operator intervention cannot be avoided, it shall be possible to carry it out easily and safely.

CEN

Type Std A: EN ISO 12100

CENELEC | Other

Rules: ISO/TR 14121-2

1.6.5 - Cleaning of internal parts

The machinery or related product shall be designed and constructed in such a way that it is possible to clean internal parts, which have contained dangerous substances or mixtures without entering them; any necessary unblocking shall also be possible from the outside. If it is impossible to avoid entering the machinery or related product, it shall be designed and constructed in such a way as to allow cleaning to take place safely.

CEN

Type Std A: EN ISO 12100

Type Std B: EN 547-1; EN 547-2; EN 547-3

CENELEC | Other

Rules: ISO/TR 14121-2

1.7 - Information

1.7.1 - Information and warnings on the machinery or related product**1.7.1 - Information and warnings on the machinery or related product**

Information and warnings on the machinery or related product shall preferably be provided in the form of readily understandable symbols or pictograms.

Any written or verbal information and warnings must be expressed in a language which can be easily understood by users, as determined by the Member State concerned.

CEN

Type Std A: EN ISO 12100

Type Std B: EN 981; EN 61310-1; EN 61310-2; EN 61310-3

CENELEC | Other

Rules: ISO/TR 14121-2

1.7.1.1 - Information and information devices

The information needed to control machinery or a related product shall be provided in a form that is unambiguous and easily understood. It shall not be excessive to the extent of overloading the operator.

Visual display units or any other interactive means of communication between the operator and the machinery or related product shall be easily understood and easy to use.

CEN

Type Std A: EN ISO 12100

Type Std B: EN 894-1; EN 894-2; EN 894-3; EN 894-4; EN 61310-1; EN 61310-2; EN 61310-3; EN 842; EN 981

CENELEC | Other

Rules: ISO/TR 14121-2

1.7.1.2 - Warning devices

Where the health and safety of persons may be endangered by a fault in the operation of unsupervised machinery or a related product, the machinery or related product shall be equipped in such a way as to give an appropriate acoustic or light signal as a warning.

Where machinery or a related product is equipped with warning devices, these shall be unambiguous and easily perceived. The operator shall have facilities to check the operation of such warning devices at all times.

The requirements of the specific Union legal acts concerning colours and safety signals shall be complied with.

CEN

Type Std A: EN ISO 12100

Type Std B: EN 61310-1; EN 61310-2; EN 61310-3; EN 981

CENELEC | Other

Rules: ISO/TR 14121-2

1.7.2 - Warning of residual risks

Where risks remain despite the inherent safe design measures, safeguarding and complementary protective measures adopted, the necessary warnings, including warning devices, shall be provided.

CEN

Type Std A: EN ISO 12100

Type Std B: EN 61310-1; EN 61310-2; EN 61310-3; EN 842; EN 981

CENELEC | Other

Rules: ISO/TR 14121-2

1.7.3 - Marking of machinery or related products

In addition to the marking requirements in Article 10 and 24, machinery or related products shall be marked visibly, legibly and indelibly.

Machinery or related products covered by chapters 2 to 6 of this Annex shall also be marked according to the additional requirements set out in those chapters.

Furthermore, machinery, or a related product, designed and constructed for use in a potentially explosive atmosphere shall be marked accordingly.

Machinery or related products shall also bear full information relevant to their type and essential for safe use.

Such information is subject to the requirements set out in section 1.7.1.

Where machinery or a related product part is handled during use with lifting equipment, its mass shall be indicated legibly, indelibly and unambiguously.

CEN

Type Std A: EN ISO 12100

CENELEC | Other

Rules: ISO/TR 14121-2; EN 82079-1

1.7.4 - Instructions for use

In addition to the obligations set out in Article 10(7), instructions for use shall be drawn up as set out below.

By way of exception to Article 10(7), the maintenance instructions intended for use by specialised personnel mandated by the manufacturer or its authorised representative may be supplied in only one official language of the Union which the specialised personnel understand.

CEN

Type Std A: EN ISO 12100

CENELEC | Other

Rules: ISO/TR 14121-2

1.7.4.1 - General principles for the drafting of instructions for use

(a) The contents of the instructions for use shall cover not only the intended use of the machinery or related product but also take into account any reasonably foreseeable misuse thereof;

1.7.4.1 - General principles for the drafting of instructions for use

- (b) In the case of machinery or related products intended for use by non-professional operators, the wording and layout of the instructions for use shall take into account the level of general education and acumen that can reasonably be expected from such operators.

CEN

Type Std A: EN ISO 12100

CENELEC | Other

Rules: ISO/TR 14121-2; EN 82079-1

1.7.4.2 - Contents of instructions for use

1. Instructions for use shall contain, where applicable, at least the following information:

- the business name and full address of the manufacturer and, where applicable, of its authorised representative;
- the designation of the machinery or related product as marked on the machinery or related product itself, except for the serial number (see section 1.7.3);
- the EU declaration of conformity, or the internet address or machine readable code, where the EU declaration of conformity can be accessed, in accordance with Article 10(8);
- a general description of the machinery or related product;
- the drawings, diagrams, descriptions and explanations necessary for the use, maintenance and repair of the machinery or related product and for checking its correct functioning;
- a description of the workstation(s) likely to be occupied by operators;
- a description of the intended use of the machinery or related product;
- warnings concerning the ways in which the machinery or related product must not be used that experience has shown might occur;
- assembly, installation and connection instructions, including drawings, diagrams and the means of attachment and the designation of the chassis or installation on which the machinery or related product is to be mounted;
- instructions relating to installation and assembly for reducing noise or vibration;
- instructions for the putting into service and use of the machinery or related product and, if necessary, instructions for the training of operators;
- information about the residual risks that remain despite the inherent safe design measures, safe guarding and complementary protective measures adopted;
- instructions on the protective measures to be taken by the user, including, where appropriate, the personal protective equipment to be provided;
- the essential characteristics of tools, which may be fitted to the machinery or related product;
- the conditions in which the machinery or related product meets the requirement of stability during use, transportation, assembly, dismantling when out of service, testing or foreseeable breakdowns;
- instructions with a view to ensuring that transport, handling and storage operations can be made safely, giving the mass of the machinery or related product and of its various parts where these are regularly to be transported separately;
- the operating method to be followed in the event of accident or breakdown; if a blockage is likely to occur, the operating method to be followed so as to enable the equipment to be safely unblocked;
- the description of the adjustment and maintenance operations that should be carried out by the user and the preventive maintenance measures that should be observed taking account of the design and the use of the machinery or related product;
- instructions designed to enable adjustment and maintenance to be carried out safely, including the protective measures that should be taken during these operations;
- the specifications of the spare parts to be used, when these affect the health and safety of operators;
- the following information on airborne noise emissions:
 - the A-weighted emission sound pressure level at workstations, where this exceeds 70 dB (A); where this level does not exceed 70 dB (A), this fact shall be indicated;
 - the peak C-weighted instantaneous sound pressure value at workstations, where this exceeds 63 Pa (130 dB in relation to 20 µPa);
 - the A-weighted sound power level emitted by the machinery or related product, where the A-weighted emission sound pressure level at workstations exceeds 80 dB (A).

These values shall be either those actually measured for the machinery or related product in question or those established on the basis of measurements taken for technically comparable machinery or for a technically comparable related product, which is representative of the machinery or related product to be produced.

In the case of very large machinery or a related product, instead of the A-weighted sound power level, the A-weighted emission sound pressure levels at specified positions around the machinery or related product may be indicated.

Where the harmonised standards or common specifications adopted by the Commission in accordance with Article 20(3) cannot be applied, sound levels shall be measured using the most appropriate method for the machinery or related product.

Whenever sound emission values are indicated, the uncertainties surrounding these values shall be specified. The operating conditions of the machinery or related product during measurement and the measuring methods used shall be described.

Where the workstation(s) are undefined or cannot be defined, A-weighted sound pressure levels shall be measured at a distance of 1 m from the surface of the machinery or related product and at a height of 1,6 m from the floor or access platform. The position and value of the maximum sound pressure shall be indicated.

With respect to noise reduction machinery or related products, the instructions for use shall specify, where appropriate, how to correctly assemble and install that equipment (see also section 1.7.4.2(1), point (j)).

Where specific Union legal acts lay down other requirements for the measurement of sound pressure levels or sound power levels, those legal acts shall be applied and the corresponding provisions of this section shall not apply;

- information on the necessary precautions, devices and means for the immediate and gentle rescue of persons;
- where machinery or related products are likely to emit non-ionising radiation, which may cause harm to persons, in particular persons with active or non-active implantable medical devices, information concerning the radiation emitted for the operator and exposed persons;
- where the design of machinery or related products allows emissions of hazardous substances from the machinery or related product, the characteristics of the capturing, filtration or discharge device if such device is not provided with the machinery or related product, and any of the following:
 - the flow rate for the emission of hazardous materials and substances from the machinery or related product;
 - the concentration of hazardous materials or substances around the machinery or related product coming from the

1.7.4.2 - Contents of instructions for use

- machinery or related product or from materials or substances used with the machinery or related product;
- (iii) the effectiveness of the capturing or filtration device and the conditions to be observed to maintain its effectiveness over time.

The values referred to in the first subparagraph shall either be actually measured for the machinery or related product in question or established based on measurements in respect of technically comparable machinery or a technically comparable related product, which is representative of the state of the art.

CEN

Type Std A: EN ISO 12100

CENELEC | Other

Rules: ISO/TR 14121-2; EN 82079-1

1.7.5 - Sales literature

Sales literature describing the machinery or related product shall not contradict the instructions for use as regards health and safety aspects. Sales literature describing the performance characteristics of the machinery or related product shall contain the same information on emissions as is contained in the instructions for use.

CEN

Type Std A: EN ISO 12100

CENELEC | Other

Rules: ISO/TR 14121-2; EN 82079-1